Nuclear Reaction Model Analysis of the Fast Neutron Induced (n,p) Reaction Cross Sections

Gonchigdorj Khuukhenkhuu[1], Yurii M. Gledenov[2], Baramsai Bayarbadrakh[1]

[1] *Nuclear Research Center, National University of Mongolia*
[2] *Frank Laboratory of Neutron Physics, JINR, Dubna, Russia*

In last decade, a systematic study of known experimental cross sections of the (n,p) and (n,a) reactions induced by fast neutrons was carried out in the wide energy interval and for a broad mass numbers of target nuclei [1-3].

In this paper, we suggest a theoretical explanation on existence of a systematic regularity which was observed in the fast neutron induced (n,p) reaction cross sections. For the theoretical analysis the statistical model, simple exciton model of Griffin and PWBA are used. For systematic analysis of (n,p) reaction cross sections simple and convenient formulae were deduced. It was shown that theoretical (n,p) cross sections are satisfactorily in agreement with experimental values for the 14.5 MeV neutrons.

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Email: g_khuukhenkhuu@yahoo.com